



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/781,026

02/18/2004

Paul F. Illegems

5707-05600

2821

7590

01/23/2006

Jeffrey C. Hood  
Meyertons, Hood, Kivlin, Kowert & Goetzel PC  
P.O. Box 398  
Austin, TX 78767

EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/781,026	<b>Applicant(s)</b> ILLEGEMS ET AL.	
	<b>Examiner</b> Gail Verbitsky	<b>Art Unit</b> 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-28 *ac* ~~1, 2, 5, 7, 13, 15, 16, 18, 20 and 22-27~~ is/are pending in the application.
- 4a) Of the above claim(s) 4, 6, 14, 17, 21 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7-13, 15, 16, 18-20 and 22-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 4, 6, 14, 17, 21 and 28 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/12/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Species B (claims 1-3, 5, 7-13, 15-16, 18-20, 22-27) in the reply filed on November 02, 2005 is acknowledged. Claims 4, 6, 14, 17, 21, 28 are withdrawn as directed to non-elected Invention/ species.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 7-13, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Grannes et al. (U.S. 20040001527) [hereinafter Grannes] in view of Cabib et al. (U.S. 5823681) [hereinafter Cabib].

Grannes discloses in Fig. 1 a temperature measuring device comprising a plurality pn-junctions (temperature sensing diodes) grouped into  $n(n-1)/2$  pairs (three pairs/ six junctions) comprising a first pn-junction coupled antiparallel to a second pn-junction. The device also has  $n$  (three) access points (pins), wherein  $n$  is an integer greater than 1. The junctions are distributed on an IC to measure temperature of the IC (paragraph [0028]). Gannes also teaches to calibrate the junctions by sensing a first current and a second current through the junction to generate an output voltage across the junction to determine the current dependent voltage difference.

For claims 3, 9, 11, 12, 19: The pn-junctions can be accessed individually (abstract) and thus, independently.

For claim 13: The circuit is configured as a temperature measuring circuit.

Grannes does not explicitly states that the (temperature sensing) junctions can be accessed simultaneously.

Cabib discloses a plurality temperature sensors measuring temperature at different locations of a wafer simultaneously or independently.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Grannes, so as to allow the operator to access temperature at different locations/ from different temperature sensors simultaneously, as taught by Cabib, in order to obtain the temperature data of the entire wafer/ IC, so as to allow the operator/ processor to instantly compare one area of the IC with another, and see where the overheating occurred, so as to take necessary actions.

4. Claims 5, 15-16, 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grannes and Cabib as applied to claims 1-3, 7-13, 18-20 above, and further in view of Sheehan et al. (U.S. 6736540) [hereinafter Sheehan].

Grannes and Cabib disclose the device as stated above.

They do not explicitly teach that the pn-junction can be a bipolar transistor. They do not teach  $V_{be}$ .

Sheehan discloses in Fig. 1 a temperature sensing pn-junction (diode) D1 for an integrated circuit IC. The temperature of a part of the IC where the junction located is

Art Unit: 2859

determined by providing a first current to the junction and determining first  $V_{be}$ , providing second current to the junction and determining second  $V_{be}$ , then determining delta  $V_{be}$  representative the temperature of interest. Sheehan states that the junction can also be a diode connected bipolar transistor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device disclosed by Grannes and Cabib, so as to determine delta  $V_{be}$  representative temperature, as taught by Sheehan, in order to accurately measure temperature of the IC, as already suggested by Sheehan and prevent the IC from overheating.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the pn-junction (diode) disclosed by Grannes and Cabib, with the pn-junction (diode connected bipolar transistor), as taught by Sheehan, because both of them are alternate types of temperature measuring pn-junctions, which will perform the same function, of measuring the temperature of the part of the IC where they are located, if one is replaced with the other.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gail Verbitsky whose telephone number is 571/ 272-2253. The examiner can normally be reached on 7:30 to 4:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571/ 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GKV

*Gail Verbitsky*  
Primary Patent Examiner, TC 2800



January 05, 2006